

REMARKS

This is in reply to the Office Action mailed 30 July 2010. By this Amendment claims 1-4, 11, 13, 15-17, 23, 25-26, , 30, 35, 40, 42, 44, 46 and 50 have been amended. Claims 5-8, 22, 36-37 and 43 have been cancelled. New claim 58 has been added.

Election/Restrictions

The applicant confirms the election of claims 1-40 and 42-57 without traverse.

Drawings

The applicant is submitting better quality representations of Figures 2 and 3. It is submitted the substitute drawings are in compliance with 37 CFR 1.121(d) and that no new matter has been added. As indicated in the specification, Figures 2 and 3 are photographs taken using a CCD camera in conjunction with an optical microscope. The substitute drawings were filed on 4 May 2005 during the international phase of the predecessor PCT application.

Specification

The applicant has amended the Abstract so that it comprises less than 150 words.

Claim Rejections - 35 USC §112

The Examiner has rejected claims 1-4, 9-40, 42-44 and 46-57 under 35 U.S.C. 112, first paragraph, as failing to reply to the written description requirement. The applicant has

amended independent claims 1, 42 and 46 to recite a "droplet" rather than a "primary vessel". The Examiner has acknowledged the practice of the subject invention using a droplet is well described in the applicant's specification. It is therefore submitted that this amendment overcomes the Examiner's rejection of the above claims.

The applicant has cancelled claims 22 and 55 without prejudice which obviates the Examiner's rejection of such claims.

The applicant has amended claim 40 to refer to optimizing the ionic make-up of the solution to promote nucleation of the solute prior to applying the induction potential. It is submitted that the metes and bounds of this claim would be readily apparent to a person skilled in the art in view of the teachings of the applicant's specification, including paragraphs [00100]-[00104].

The Examiner has rejected claims 1-4, 9-40, 42-44 and 46-57 under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for droplets as vessels, does not reasonably provide enablement for walled vessels. As indicated above, the applicant has amended independent claims 1, 42 and 46 to recite a "droplet" rather than a "primary vessel" and hence the amended claims do not encompass walled vessels. It is submitted that this amendment renders moot the Examiner's rejection.

The Examiner has rejected claims 1-40 and 42-57 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Regarding claims 1, 42 and 46, it is submitted that the phrase "acquires a net charge" would be readily understood by a person skilled in the art in view of at least paragraph [00069] of the specification. Regarding claim 2, the applicant has amended claim 2 to refer to "a threshold value

necessary to induce the onset of nucleation". It is submitted that this feature would be readily understood by a person skilled in the art in view of at least paragraph [00066] of the application. Claim 8 has been cancelled which obviates the Examiner's rejection of that claim. Regarding claim 15, it is submitted that the meaning of the term "volatile solvent" would be readily apparent to a person skilled in the art in view of at least [00077] of the specification. The applicant has amended claim 16 to substitute the word "wherein" for "herein" as suggested by the Examiner. Regarding claim 19, it is submitted that the meaning of the phrase "used to promote crystallization" would be readily apparent to a person skilled in the art in view of at least [000100] - [000104] of the specification. Regarding claims 20, 22, 39 and 49, it is submitted that the meaning of the term "solid" would be readily apparent to a person skilled in the art; the applicant has cancelled claim 22 without prejudice which obviates the Examiner's objection to the word "melt". The applicant has amended claims 23-26 so that such claims depend from claim 21 rather than 22. Regarding claims 21, 28, 54 and 55 it is submitted that the meaning of the phrase "organic compounds and inorganic compounds" would be readily apparent to a person skilled in the art. Regarding claim 40, the applicant has amended this claim to refer to optimizing the ionic make-up of the solution to promote nucleation of the solute. It is submitted that the metes and bounds of this claim would be readily apparent to a person skilled in the art in view of the teaching of the applicant's specification, including paragraphs [00100]-[00104]. Claim 50 has been made dependent on claim 48 rather than claim 46 as suggested by the Examiner. Claim 55 has been cancelled which obviates the Examiner's objection to this claim. Claim 57 has been amended to delete the text ".1."

The Examiner has rejected claims 1-4, 9-40, 42-44, and 46-57 under 35 U.S.C. 112, second paragraph, as failing to set forth the subject matter which applicant(s) regard as their invention. The applicant has cancelled claims 36 and 37 and has amended

independent claims 1, 42 and 46 as indicated above to refer to a droplet rather than a primary vessel. Accordingly, it is submitted that the amended claims do not encompass a walled primary vessel. Further it is submitted that the data presented in Figures 12-14 (paragraph [000130]) does not render applicant's claims as amended indefinite.

Claim Rejections - 35 USC §101

It is submitted that a person skilled in the art would appreciate that controllably inducing nucleation of a solute requires human intervention. Further, independent claims 1, 42 and 46 as amended recite applying an induction potential to a droplet using an induction electrode and levitating a droplet in an electrodynamic balance. It is submitted that such features clearly relate to a particular machine requiring human intervention and are not directed to a natural phenomenon. Moreover, the claims are directed to the particular transformation of a solute into a different state, namely nucleation of at least some of the solute in a condensed phase. The Examiner is therefore respectfully requested to withdraw the rejection that claims 1, 42 and 46 are not directed to statutory processes under §101.

Claim Rejections - 35 USC §102

The Examiner has initially rejected claims 1-21, 23-25, 27-30, 40 and 42-49 under 35 U.S.C. 102(b) as being anticipated by Chung et al. (Journal of Crystal Growth 1998)(IDS)(Chung) as evidenced by Bakhoun et al. (Analytical Chemistry 2005)(IDS)(Bakhoun).

The Chung reference is referred to in paragraph [00017] of the applicant's specification and in endnote 87. Chung describes a hybrid ultrasonic-electrostatic levitator which

includes a reflector and a transducer (Chung, Fig. 1). As indicated at page 386 of Chung, a charged solution drop is suspended almost entirely electrostatically and a low ultrasonic power is used to generate a precisely controlled torque. Thus the droplet is acoustically rotated in order to simulate some of the aspects of a low-gravity or space environment. As acknowledged by the Examiner in paragraph 15 of the Office Action, Chung describes an acoustic balance.

Applicant has amended independent claims 1, 42 and 46 to include the step of levitating a droplet in an electrodynamic balance. Support for this amendment is found, *inter alia*, in claim 8, Figure 1 and paragraphs [00073] and [000195] of the applicant's specification. It is submitted that the Chung levitator is an acoustic balance rather than electrodynamic balance. Further, it is submitted that it would not be obvious to substitute an electrodynamic balance as taught by the applicant for the Chung acoustic balance which consists of a reflector and transducer as it would not then be possible to impart a rotational force to the droplet. As indicated above, a primary purpose of the Chung containerless system is to reproduce some of the aspects of a low-gravity environment by rotating the droplet while it is suspended.

Further, it is submitted that Chung does not specifically teach a method that lowers the mass to charge ratio of a droplet to thereby controllably causing ion-induced nucleation as recited in applicant's independent claims as amended.

It is therefore submitted that independent claims 1, 42 and 46 as amended are not anticipated by Chung. Further, it is submitted that dependent claims 2-21, 23-25, 27-30, 40, 43-45 and 47-49 depend from an allowable base claim and are similarly allowable.

The Examiner has initially rejected claims 1, 5-10, 22, 46, 51 and 55 under 35 U.S.C. 102(a) and 102(b) as being anticipated by Kelton et al. (Physical Review Letters 2003) (Kelton).

It is submitted that Kelton does not teach the subject matter of applicant's independent claims 1, 42 and 46 as amended. Kelton relates to electrostatically levitated metallic liquids rather than a method of controllably inducing nucleation of a first solute dissolved in a solution wherein the method reduces the mass to charge ratio of a droplet containing the solution. Also Kelton does not impart an induction potential to a droplet using an induction electrode. Rather, ultraviolet light was used to positively charge the samples.

Claim Rejections - 35 USC §103

The Examiner has initially rejected claims 26, 33, 34, 51, 52, 54 and 56 under 35 U.S.C. 103(a) as being unpatentable over Chung in view of Bogan et al. (Analytical Chemistry 2002)(IDS)(Bogan) and Medzihradsky et al. (Analytical Chemistry 2000)(Medzihradsky).

It is submitted that applicant's independent claims as amended are patentably distinguishable from Chung for the reasons submitted above. Moreover, as acknowledged by the Examiner, Chung does not teach co-crystallization of two solutes. It is submitted that neither Bogan nor Medzihradsky remedy the deficiencies in Chung. It is therefore submitted that the above dependent claims depend from allowable base claims and are similarly allowable.

The Examiner has initially rejected claims 31, 32 and 53 under 35 U.S.C. 103(a) as

being unpatentable over Chung in view of Bogan and Medzihradszky and further in view of Julian et al. (Journal of Physical Chemistry B 2002)(IDS)(Julian).

It is submitted that applicant's independent claims as amended are patentably distinguishable from Chung for the reasons submitted above. It is submitted that Bogan, Medzihradsky and Julian do not remedy the deficiencies in Chung. It is therefore submitted that the above dependent claims depend from allowable base claims and are similarly allowable.

The Examiner has initially rejected claim 35 under 35 U.S.C. 103(a) as being unpatentable over Chung in view of Bogan in view of Zaccaro et al. (Crystal Growth and Design 2001)(IDS)(Zaccaro).

It is submitted that applicant's independent claims as amended are patentably distinguishable from Chung for the reasons submitted above. It is submitted that neither Bogan nor Zaccaro remedy the deficiencies in Chung. It is therefore submitted that dependent claim 35 depends from an allowable base claims and is similarly allowable.

The Examiner has initially rejected claim 38 under 35 U.S.C. 103(a) as being unpatentable over Chung in view of Julian. It is submitted that applicant's independent claims as amended are patentably distinguishable from Chung for the reasons submitted above. Moreover, as acknowledged by the Examiner, Chung does not teach co-crystallization of two solutes. It is submitted that Julian does not remedy the deficiencies in Chung. It is therefore submitted that dependent claim 38 depends from an allowable base claim and is similarly allowable.

The Examiner has initially rejected claims 39 and 50 under 35 U.S.C. 103(a) as being unpatentable over Chung. It is submitted that applicant's independent claims as amended are patentably distinguishable from Chung for the reasons submitted above. Moreover Chung does not explicitly teach the features recited in claims 39 and 50 as acknowledged by the Examiner. It is therefore submitted that the above dependent claims depend from allowable base claims and are similarly allowable

The Examiner has initially rejected claim 57 under 35 U.S.C. 103(a) as being unpatentable over Chung in view of Bogan and Medzihradzky , and further in view of Zaccaro.

It is submitted that applicant's independent claims as amended are patentably distinguishable from Chung for the reasons submitted above. It is submitted that Bogan, Medzihradzky and Zaccaro do not remedy the deficiencies in Chung. It is therefore submitted that dependent claim 57 depends from an allowable base claim and is similarly allowable.

Double Patenting

Claim 74 was cancelled from US patent application No. 10/399823 , now US Patent No. 7,785,897. Accordingly, it is submitted that this renders moot the Examiner's provisional obviousness-type double patenting rejection.

Summary

In summary, the Applicant respectfully requests withdrawal of the rejections and allowance of the claims as amended.

If the Examiner has any questions about this paper, or is not convinced that the claims are in condition for allowance, Applicant requests a personal or telephonic interview with the Examiner.

Respectfully submitted,

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